Supplementary Submission No 180a

SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

Organisation: Geni Energy

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Inquiry into Sustainability of energy supply and resources in NSW - Supplementary Submission

Geni.Energy Ltd

The Northwest of New South Wales offers fantastic potential for NSW's future sustainable energy supply. Since our original Submission to this Inquiry in September 2019, Geni.Energy Limited has progressed significantly and offers here a more detailed analysis of the current situation and further developed solutions for our region. This submission also outlines our key hurdles to the development of renewables in our region and gives recommendations for support that the Parliament's Environment and Planning Committee can provide to Geni.Energy and the Northwest region.

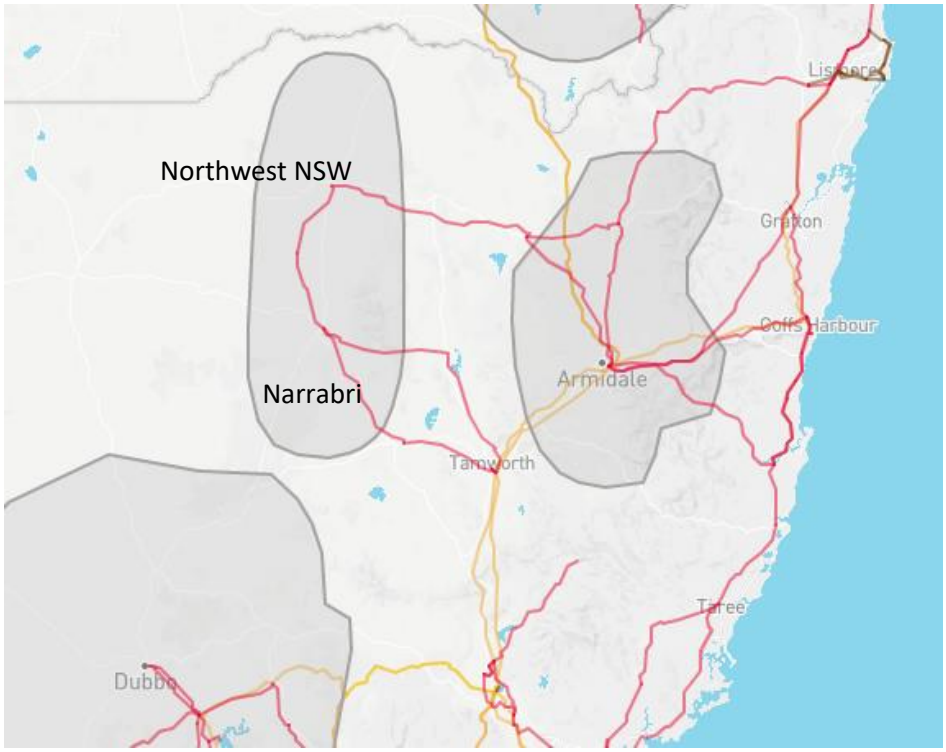

Figure 1 AEMO ISP Map of the Region Indicating Future Stage REZ Zone Indicated for Northwest NSW

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The Northwest's Future is in Renewables Plus Storage

The Northwest's solar and wind potential for renewable energy generation has been found to be excellent. This has set the stage for a highly competitive source of electricity for the region that can not only meet our current local demand but also form the basis for new industry and jobs for our rural communities.

The Renewable Narrabri[i] report developed by the Institute for Sustainable Futures, UTS, in 2018 mapped in detail and analyzed the wind and solar resource for the shire. It found that a renewable energy industry featuring solar and wind energy would produce up to 500 jobs during peak construction time. In addition, between 200 and 500 local jobs would be provided in operation and maintenance over the period 2020-2030. The study proved we could support 622MW of solar generation and 175MW of wind, based on our local renewable resources and available land mass.

The region boasts good renewable resources that can meet the need identified by the Australian Energy Market Operator (AEMO). In its latest Integrated Systems Plan (ISP) for 2020 it outlines that by 2030 there is a need for new dispatchable energy supply to the National Energy Market (NEM), as coal fired power stations retire. Using current cost assumptions, AEMO has determined that by that time new batteries will be more cost effective than gas powered generation to meet this intermittent demand.

AEMO[ii] has made assumptions that at today's capital cost of install for a 4-hour battery is $1,964/kW it needs to be charged for free to be competitive with a new Open Cycle Gas Turbine plant (at $1,416/kW). However, as batteries are expected to drop to >$922/kW by 2030, gas prices would need to be as low as $4/GJ in the long term and charging costs would need to be as high as $30/MWh to keep gas as an economic option. Charging costs on average currently, in every state except NSW are already less than $30/MWh and are frequently worth <$0/MWh (or even negative at peak solar generation times). Our understanding is that some companies are already offering batteries at far lower capital costs as well.

New economic modelling from Santos (by ACIL Allen)[iii] submitted at the eleventh hour to the NSW Independent Planning Commissions shows gas prices generally increasing over the next two decades and from 2030-2040, staying above $9/GJ (with or without the proposed Narrabri gasfield).

This makes gas a totally uneconomic option and places the priority on renewables with storage immediately.

The recent investment by AGL into 1,200 MW of battery storage in NSW is testament to this inevitability[iv].

The Fear Of Stranded Assets

Concerns are high in the Northwest currently as the NSW Government's Independent Planning Commission (IPC) assesses the Narrabri Gas Project application for production.

A decision is expected by the end of September which will have a huge impact on the region.

We are highly concerned that an approval will be given to the gasfield and as Mr Matt Kean pointed out in the media "I personally wouldn't be betting on gas, given the low cost alternatives that are coming into the market, but if the market wants to take that chance, good luck to them[v]."

The trouble is, there is a very real risk that the gasfield will be approved without an investment decision ever being made. This project has been threatening to be built for ten years; it was even given a "fast track" option through the planning process a few years ago. But the longer it drags on, the more investment uncertainty surrounds the region.

Evidence from the USA, shows the number of operating drill rigs has fallen 73% in the last 12 months, while USA LNG exports have halved already in 2020. Deloitte reports[vi] that a third of U.S. shale producers have become technically insolvent at the current oil prices which also underpin Santos' LNG prices. Already in USA this year, 19 oil and gas companies have filed for bankruptcy.[vii]

Santos has written off a further $950 million from its failed Coal Seam Gas to Liquefied Natural Gas investments in Australia and this brings total write-downs by the company since 2014 close to $8 billion. Again, there is ample evidence that unconventional gas production in Eastern Australia, Queensland included, is not currently profitable[viii].

We are concerned that 'letting the market decide' will leave our community with broken promises and stranded assets. We would prefer a strong policy setting around renewables for the Northwest.

Wind Is a Real Potential For The Northwest

Although addressed in our original submission, we would like to expand on the potential for the Northwest to utilize the wind resource and reinforce the benefits for the region in developing this opportunity alongside other renewable energy resources. Wind can play a crucial role in a mix of energy sources to create a sustainable and reliable grid, by providing energy at night. The Northwest region does have good wind resource.

The Renewable Narrabri report developed by the Institute for Sustainable Futures, UTS, in 2018 mapped in detail and analyzed the wind resource for the shire.

It stated[ix];

"In order to operate wind farms economically, the average annual wind speed should not be below 6 m/s. The map below shows the range of wind speeds prevalent in the region with the blue areas at the lower end of 5 – 6 m/s and the yellow areas with 7 – 8 m/s. As seen in the map, the south and a small part of the northeast Narrabri Shire show the best potential for wind generation. However, this area falls under National Parks and Nature Reserves.

The potential land area …. focuses on land available for primary production (excluding the land earmarked by the government as Strategic Agricultural land). ***Except the southeast corner of the Narrabri Shire, the region has a medium to good wind potential.***

The overall area with an average annual wind speed of over 6m/s covers 5,684 km2 which is 43% of the Shire's area.

The maximum wind turbine density is calculated with 5 MW per square kilometre, meaning that 1 large or 2 medium size wind turbines, in either case with a hub height not under 100m can be installed per square kilometre. The actual space requirement for one turbine is around 25 X 25 m for the fundament of the tower and grid connection equipment; the distance in-between wind turbines should be 6 to 7 times the rotor diameter (of around 100 – 130 m) in order to achieve a good wind farm efficiency. The land in between the turbines of a wind farm can of cause be used as agricultural land as usually done in wind farms of Europe, the Americas and Asia.

With these assumptions, 44% of the Narrabri Shire is suitable to host wind farms which adds up to a technical potential of over 28 GW of installed wind capacity."

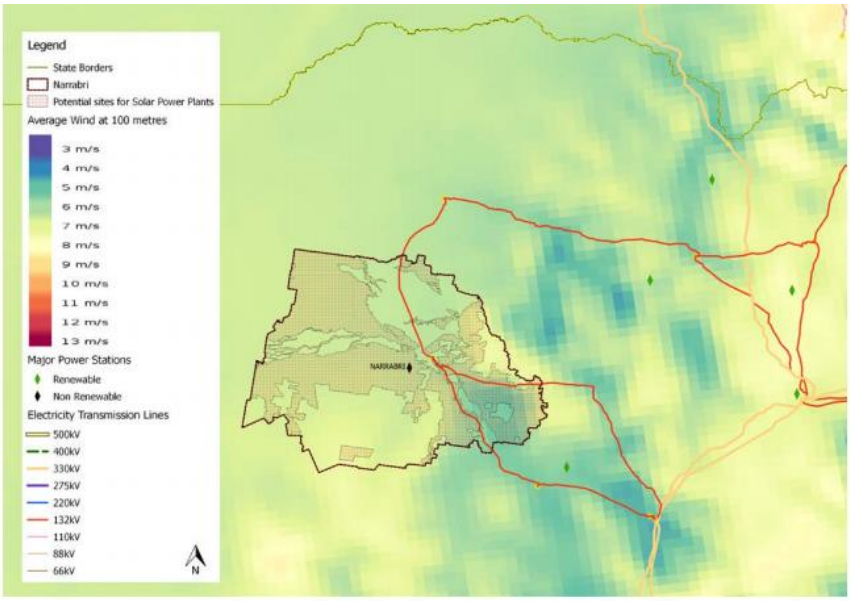

Figure 2 Wind Potential for Narrabri Shire is very good

An individual wind study that we have had undertaken in the region also verifies these findings. The average night time wind speeds across the year were 7.8m/s with a maximum speed of over 20m/s recorded most months.

Regional Energy Zones Deprioritize Community

Regional Energy Zones (REZ) have been identified for priority attention and investment across NSW by the NSW government and AEMO. We note that one of the four pillars of the REZ method is "community engagement" and yet the way that REZ's have been identified and applied is a top-down approach, immediately alienating communities from the process.

In the case of the North West, our region has not been identified as an early stage REZ, despite being flanked by REZ's on both sides of our region (Orana REZ to the south and New England REZ to the north and east).

However, our region's people have the motivation to make a REZ work. We have already put in the foundation of community engagement and are well on our way with community led initiatives.

AEMO has identified a Northwest REZ in later stages of development (after 2030), but by this stage we believe the Northwest Regional Energy Precinct will be well underway.

A door-to-door survey of the whole of Narrabri township was undertaken by a team of over 50 volunteers in late 2018. The survey received over 800 respondents and found that 97% of residents on Narrabri supported a renewable energy future for the region[x].

There is already momentum in the Northwest for a Renewable Energy Zone, led by Geni.Energy supporters.

Northwest Need for Proactive Transition Policy

Narrabri Shire area consists of several towns and villages including Narrabri and Boggabri as part of the Northwest region. A cluster of five coal mines operate around the township of Boggabri that provide employment.

One company operating the majority of these coal mines, Whitehaven Coal, claims that 1,800 of their employees "are regionally based"[xi]. The population of Narrabri was 13,231 in 2018[xii] with a 58% participation rate, so we can assume 7,670 in the workforce.

Boggabri is a much smaller centre in the shire with a population of 1,130. Given its closer proximity to the mines, it has a much higher reliance on mining for employment with 20% of the working population stating they work in the mining industry. [xiii]

These communities are highly vulnerable as the world moves away from coal. These workers deserve a proactive transition strategy that includes their desire to remain living in Narrabri and Boggabri and their need for new employment opportunities.

Northwest Regional Energy Precinct

Recent modelling by local not-for-profit company, Geni.Energy Limited, has described a Northwest Regional Energy Precinct. This Precinct combines a large number of farm based, small-scall solar, wind and bio-energy electrical generation projects of >120MW, supported by household, commercial and community scale solar and batteries.

These generation sites combined with batteries, form the basis of the Northwest's Virtual Power Plant (VPP). Through aggregation of these distributed forms of energy generation, the VPP provides cheaper energy to power the region, without the need for transmission upgrades. This combination also fulfils immediate, dispatchable energy demands as required, orchestrating the draw of energy from a range of household, commercial and community scale batteries when needed. Excess generation will fire up local investment opportunities in manufacturing and hydrogen production.

The Regional Energy Precinct has been modelled to create around 500 construction jobs, spread over a ten-year period as this smaller-scale model creates sustainable jobs. More than 80 operational jobs that have no end date at all, are anticipated. This model would generate significant investment in the region, with investors keen to invest in new renewable energy projects and companies keen to secure renewable energy Power Purchase Agreements to meet their own zero emissions goals.

Commercial volumes of hydrogen, designated for alternative fuels supporting regional transport, in addition to commercial volumes of ammonia for fertilisers, are also essential development components of the Geni.Energy plan.

Geni.Energy is a not-for-profit company limited by guarantee. It is locally based in Northwest NSW and has developed a holistic plan to meet the needs of energy consumers in the region ensuring 24/7 dispatchable energy supply without the need for transmission upgrades (operating solely on the network).

It is crucial that not only does the region develop renewable energy projects, but also builds the capacity for the region to keep developing and maintaining the industry. This includes skills and capacity development, local investment opportunities, new business opportunities and new manufacturing opportunities; all locally based, owned and operated.

Over the next ten years Geni.Energy will create:

- Locally owned Virtual Power Plants (VPP) orchestrating the sale of energy from household rooftop solar and batteries to local energy consumers
- A swarm of small-scale wind and solar farms across the region, providing renewable energy generation for the VPP
- A range of commercial-scale energy generation and storage projects that direct financial savings back into local businesses, local not-for-profits and community ownership models
- Two key industrial parks (located at Boggabri and Narrabri) that will utilise low-cost renewable energy to forge new jobs and new industries in these towns
- A hydrogen generation capability to utilise excess green generation for fuel, energy and fertiliser production.
- The capacity, skills, logistics and businesses that are needed for a fully operational renewable energy industry

Hurdles To Development

The Northwest Regional Energy Precinct is currently facing some hurdles that are slowing its roll out. The following are the key hurdles we have identified so far:

- High cost and high degree of difficulty, along with long timeframes for connections to the grid for renewable energy and storage projects
- High demand, low number and therefore high cost of electricians given the demand by the mining industry in the region
- Lack of resourcing and human capacity to build a new renewable energy industry and transition the region away from coal
- Lack of resourcing and human capacity for undertaking the initial engineering and feasibility study stages of new renewable energy opportunities in the region (once the business case can be proven investors are highly engaged to support projects)

Recommendations for Support

Geni.Energy Ltd is ideally situated to further develop a renewable energy industry in the Northwest and we would recommend the following avenues for support:

1. Extend the NSW Department of Planning Industry and Environment's Hunter Valley Empowering Homes Program to the Northwest for zero interest loans for batteries – and potentially increase this program to include a subsidy for batteries for 600 households over the next three years.
2. Facilitate Geni.Energy to deliver energy efficiency education programs for businesses, community organizations and households, based out of our shopfront in Narrabri.
3. Identify a range of measures to decrease the cost, complexity and timing of grid connections for new renewable energy and storage projects at small to mid-scale.
4. Provide incentives for trainee/apprentice programs with electricians currently operating or those willing to move to the Northwest.
5. Provide financial operational support for Geni.Energy during the first three years startup phase until it is self-funding.
6. Provide support and resourcing for the engineering and feasibility studies for new renewable energy projects. This could be provision of consulting fees or a mentoring program or locally based government staff with these capabilities.

We thank the Parliament's Environment and Planning Committee for the opportunity to have input into the Inquiry into the Sustainability of Energy Supply and Resources in NSW.

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